



Publication number : **0 619 125 A1**

**EUROPEAN PATENT APPLICATION**

Application number : **94500044.6**

Int. Cl.<sup>5</sup> : **A63B 53/04**

Date of filing : **04.03.94**

Priority : **04.03.93 ES 9300439**

Date of publication of application :  
**12.10.94 Bulletin 94/41**

Designated Contracting States :  
**AT BE DE DK FR GR IE IT NL SE**

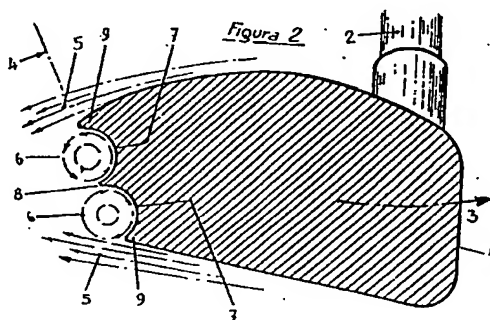
Applicant : **MAKSER, S.A.**  
**Muelle de Tomás Olabarri, 5-3 drcha.**  
**E-48930 Las Arenas-Getxo (Bizkaia) (ES)**

Inventor : **Doria Iriarte, José Javier**  
**Rodriguez Arias, 61**  
**E-48013 Bilbao (Vizcaya) (ES)**

Representative : **Gonzalez Vacas, Eleuterio**  
**Calle Sagasta, 4**  
**E-28004 Madrid (ES)**

**Improved golf club head.**

The subject is a head for a golf club that can be based on a specific design, but the head is to have improvements incorporated in order to remove or diminish the vibrations caused by the movement of the head until it impacts with the ball. These improvements are the placing on the side of the head (4) opposite to that on which the impact occurs (12), of some deep cavities (7) that begin at the edge (9) defined by the flows round the head as it moves. These cavities (7) are parallel to the edges of the rear face and are joined by a central spine (8) that separates them.



The invention refers to the sporting sector and specifically to the game of golf.

## BACKGROUND TO THE INVENTION

Regarding the simple design of the heads of golf clubs, numerous designs exist which are protected at the level of industrial models, but with regard to the scientific study of the design, we are aware of Patent of Invention n<sup>o</sup> 4 653 756 in the USA, applied for on 25.10.85 (application n<sup>o</sup> 791.207) by GOLF CLUB IRON.

The patents that were cited during its processing were numbers 1.690.388 WALDRON in the USA and 3.976.299 LAWRENCE et al., in the USA.

As already mentioned, the object of the present invention is: AN IMPROVED GOLF CLUB HEAD.

But the improvement results from a specific application of the contents claimed in Spanish Patent n<sup>o</sup> 9300372 for IMPROVED FUSELAGE IN ORDER TO ACHIEVE STABILIZATION EFFECTS IN AIR VORTICES that was also deposited in the name of the present applicant for the patent on:

In order to apply the principles and claims of the said Spanish patent, the head of a golf club is considered as a SOLID BODY that moves within a FLUID which is the air. The said head of the golf club will have the corresponding design, according to its function and in accordance with what up to now has been considered as an acceptable aerodynamic line for its use to strike against the corresponding ball.

The improvement studied here and applied to the said head of the golf club, will have an influence on the design of the fuselage which is defined by all the air flows that determine the release and consequent drag strength and also vibrations. Similarly, with the said fuselage design applied to the head of a golf club, a great part of the vibrations will be avoided that are currently caused by successive air vortices generating turbulence in the rear zone of the said golf club head, thus increasing the precision with which the golf club is used.

## DESCRIPTION OF THE INVENTION

Figure 1 shows a representation of the section (1) of the head of a golf club (2). When this golf club (2) is in use the head moves through the air in a curved trajectory according to (3), so that its face (12) hits on the corresponding ball.

During this movement of the head (1), flows (5) are produced that fall from and drag the head in question. These falling flows (5) determine the shape of the surface (4) that will be specifically the face of the head (1) that is opposite that of the face (12) and will be the place where the pertinent fuselage is to be applied.

As mentioned, in Spanish patent n<sup>o</sup> 9300372

these falling flows (5) give rise to air vortices (6) that rest on the surface (4) and cause the turbulence.

The applied fuselage covers the whole surface of the side (4) which as can be seen in the front figure (figure 8) is a curved or flat surface opposite the striking surface (12). It is precisely on this surface (4), as shown in figure 2, that the DOUBLE CAVITY (7) is formed which cavities (7) begin on the edges (9), cavities that join at the central rib (8). Then shown in figure 2, which is a section of the head of the golf club, is the whole application of the invention:

- Wide cavities (7).
- Cavities that begin next to the edges (9).
- Borders that are defined by the passage of fluids (5).
- Cavities that join at the central rib (8).

### Looking at figure 8

- The cavities (7) cover the whole front of face (4), following its curvature.

### Looking at figure 4

- The cavities (7) are parallel and separated by the central rib (8).
- Cavities (7) that communicate at their ends (10).
- Thus forming a CONTINUOUS SINGLE CAVITY 7 - 10 - 7 - 10, that allows the air vortex to be held (6), thus stabilizing the said air vortex.

### Looking at figure 6

- The cavities (7) are parallel and separated by the central rib (8).
- However the said cavities are independent of each other, with their ends terminating (11) in the manner represented on the face of figure 8.

Any of these solutions means the application of the principles and claims in Spanish patent n<sup>o</sup> 9300372, of which this present is a specific application.

- With all golf clubs known at this time and whatever the design of their heads, no one has been able to remove or clearly lessen two things:
- That the air vortices falling from the solid all round the head that is moving, cease to drag the head, with the loss of energy that this causes.
- That the veins of fluid that are given off generate air vortices that cause vibrations that give rise to clear effects felt by the hands of the sportsman who uses the golf club, thus losing precision.

With the present invention, when applied specifically to the head of a golf club, the following is achieved:

- Control of the air vortices
- Noticeable decrease in the vibration of the golf club.
- Obvious improvement in the sensitivity of the player since when noticeably avoiding the vibrations caused by the head of the club, he more effectively controls the trajectory and **MAKES THE STRIKE MORE EFFECTIVE**, both regarding the best use of energy and the place where the strike must be made, thus ensuring control over the trajectory.
- All this achieves a vital effect, which is the elimination of vibrations.

#### DESCRIPTION OF THE DRAWINGS

To complete the description given here and in order to assist in better understanding the characteristics of the invention, attached to the present descriptive memorandum, as an integral part of the same, is a set of drawings which as an illustration but not imposing any limitation, show the following:

Figure 1 is a representation of the section (1) of the head of a golf club, with three fundamental things being indicated in this figure:

- Golf club (2) that causes the trajectory (3).
- Place where percussion (12) takes place to push the corresponding ball.
- Opposite face from the strike face (12), which is the face (4) on which the NEW FUSELAGE is placed.

Figure 2 is a representation of the same section (1) of the head of the golf club. Shown in this drawing are the cavities (7) where the air vortices are held (6) in a stable form. These cavities (7) cover the whole surface (4) that terminates at the borders (9) that are around it.

Figure 3 is a side view of the head shown frontally in figure 4. It shows the passage (10) of one cavity (7) to the other that is parallel to it. This view is added to by figure 4.

Figure 4 is a front view of the whole face (4) that is covered by the NEW FUSELAGE that determines the novelty and improvement to the head of the golf club in question. We can see frontally that between the cavities (7) which are parallel there is a communication through their sides (10), so that in practice it thus becomes a SINGLE CONTINUOUS CAVITY.

Figure 5 is a side view of the head that is shown frontally in figure 6. The independence between the cavities (7) is clearly seen, since they are separated by the central rib (8). In this figure the cavity (10) of figure 3 has been exchanged for two cavities (11).

Figure 6 is a front view of the head unit (4) that is occupied by the NEW FUSELAGE that determines that NOVELTY and IMPROVEMENT of the head of the golf club in question.

It must be clarified that both what is shown in fig-

ures 3 and 4 on the one hand, and represented in figures 5 and 6 on the other, are simply an application of the NEW FUSELAGE, based on the principles claimed in Spanish patent nº 9300372.

Figure 7 is a section of the head of the golf club which is shown in side view in figure 8. The flow (5) is shown here.

Figure 8 is a side view of the head of the golf club, showing section A-A that determines figure 7. This figure also shows the flow (5).

#### DESCRIPTION OF THE DIFFERENT ELEMENTS OF THE INVENTION

1. Body of the head of the golf club, to which head has been attached THE FUSELAGE claimed in Spanish patent 9300372. This head can have different constructional designs but the important thing in this case is the IMPROVEMENT OF THE FUSELAGE that is incorporated.
2. Golf club at the end of which is the head (1). This is the stick used by the sportsman.
3. Trajectory followed by the head (1) to make impact with the face (12) on the ball.
4. Side opposite face (12). On this face the problem of placing the fuselage that improves the head (1) is resolved.
5. Flow given off over all the surface of the face (4). This is shown in figures 1 and 2 and in figures 7 and 8, that represent in the latter case a real head of a golf club.
6. Vortices that are created by the flows (5) and which in the final design of this golf club head are placed in a stable form within the cavities (7), (10) and (11) according to the final form adopted.
7. Cavities to retain the vortices.
8. Rib separating the adjoining cavities (7).
9. Borders formed all over the surface (4) that are finally defined by the series of flows (5) that are caused in practice.
10. Cavity connecting the parallel cavities (7) if the solution is adopted shown in figures 3 and 4, and which cause the creation of a single continuous cavity with the same function as cavity (7).
11. Representation of the cavities (10) seen from the front and also forming the edges (9) that are shown in figure 8. It also represents the end of the independent cavities shown in figures 5 and 6.
12. Surface of the head of the golf club that hits against the ball.

#### INDUSTRIAL APPLICATION

The intention of these improvements to the head of a golf club is undoubtedly what its name indicates.

But the improvements object of the claim can be applicable to any type of head design known today for golf clubs.

Since these improvements will form a new head when the fuselage is incorporated created individually for these heads.

The drawings have shown the two solutions for specific applications:

- That shown in figures 3 and 4.
- That shown in figures 5 and 6.

But this has been given as an indication only since the principle of the design claimed in the present patent of invention can be carried out in different shapes while keeping to the essence of the invention.

## Claims

1. Improved golf club head, of any type of those that are placed at the end of a stick to practice the game of golf, characterised essentially by referring to the shape that covers the whole of the surface (4) opposite to the face (12) that strikes the golf ball, and whose contour is finished by a border (9) that is defined by the outlet flows (5), whose surface (4) is covered by two cavities (7) with a very deep curvature and which meet at a central rib (8).
2. Improved golf club head according to claim 1, characterised because the cavities (7) that are placed separated by a central rib (8) can have a lateral communication through the cavity (10), in this case forming a continuous cavity.
3. Improved golf club head according to claim 1, characterised because the cavities (7) that are adopted to cover the whole of the opposite side (4) are kept separate by a central rib (8) and in this case terminal cavities (11) are formed next to the lateral borders (9).

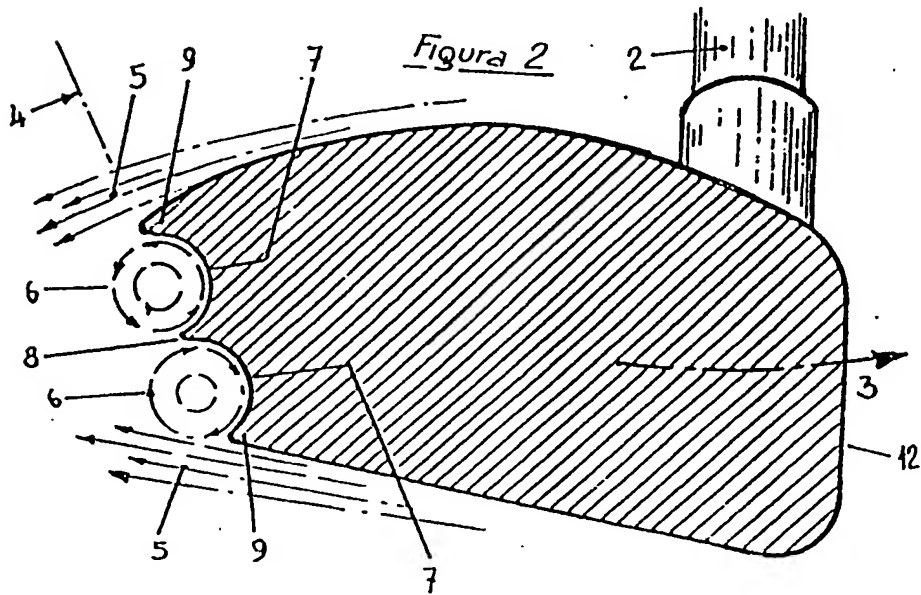
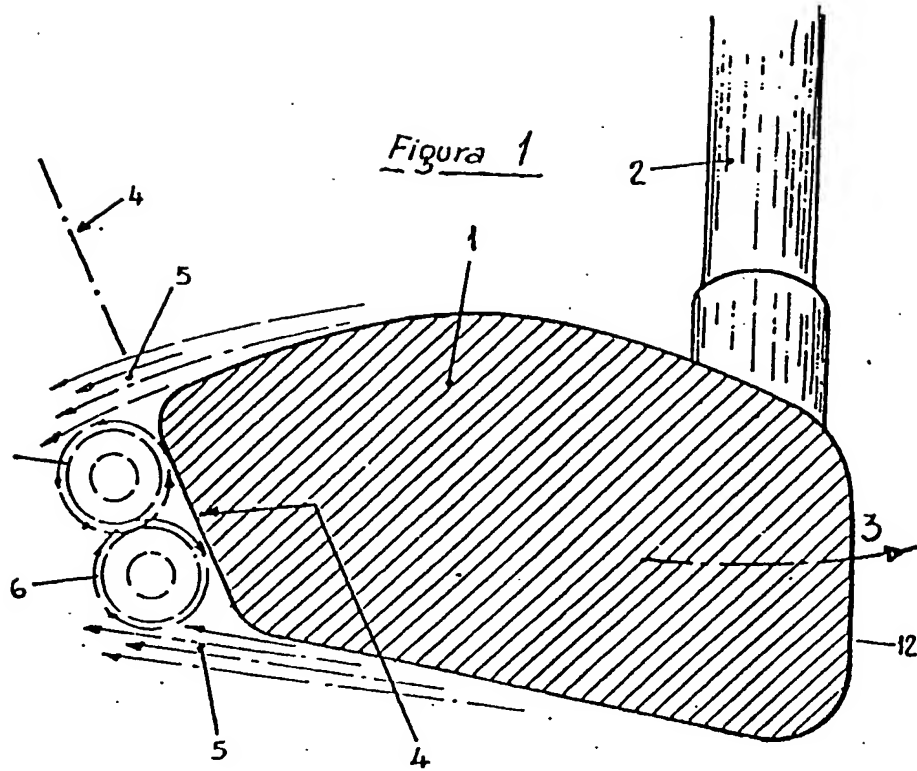


Figura 3

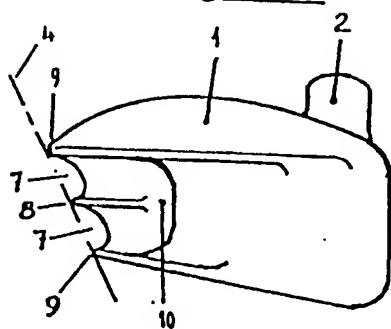


Figura 4

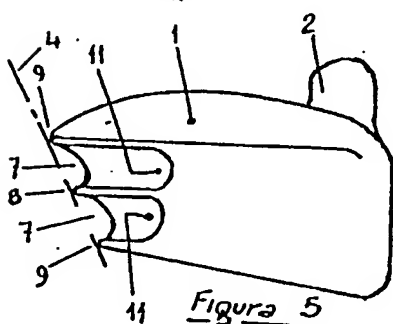
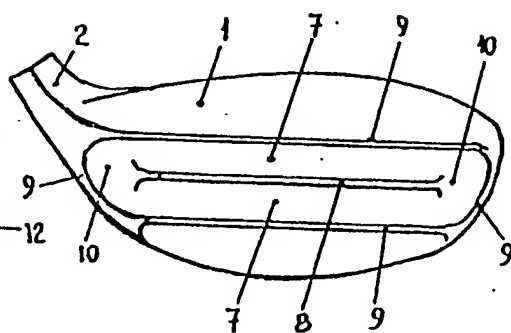


Figura 5

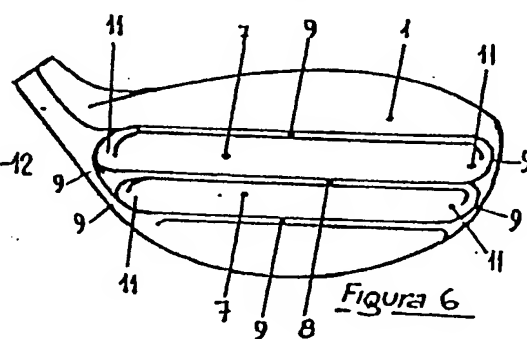


Figura 6

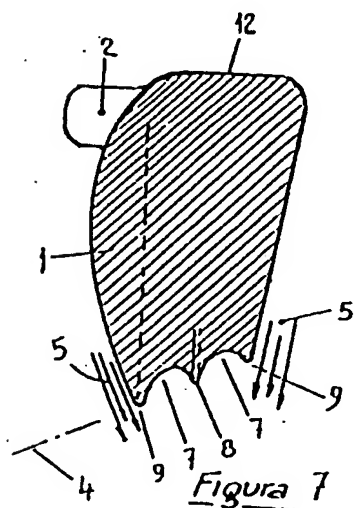


Figura 7

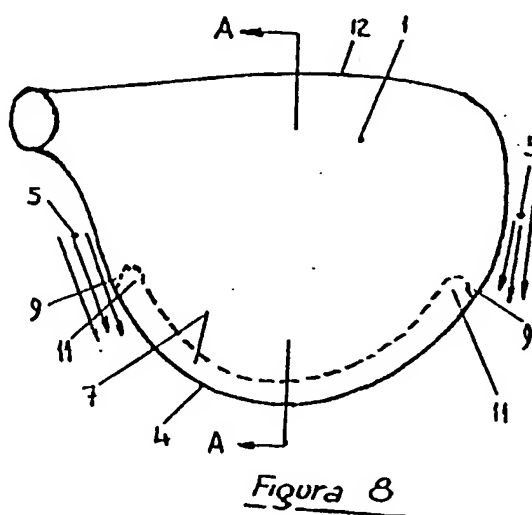


Figura 8



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 94 50 0044

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
A	US-A-4 444 392 (DUCLOS) * abstract; figures * ----	1	A63B53/04
A,D	US-A-4 653 756 (SATO) * the whole document * ----	1	
A	US-A-4 809 982 (KOBAYASHI) * abstract; figures * ----	1	
A	US-A-4 023 802 (JEPSON ET AL.) * figures * ----	1	
A	GB-A-986 979 (SLAZENGERS LIMITED) * figures * -----	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			A63B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 1 June 1994	Examiner Giménez Burgos, R
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons A : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

EPF FORM 1500 03/92 (P04/C01)